

Borehole

10-06-10**Log Event A****Borehole Information**

Farm : <u>A</u>	Tank : <u>A-106</u>	Site Number : <u>299-E25-72</u>
N-Coord : <u>41,338</u>	W-Coord : <u>47,637</u>	TOC Elevation : <u>687.06</u>
Water Level, ft :	Date Drilled : <u>4/30/1962</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>125</u>	

Cement Bottom, ft. : 130 Cement Top, ft. : 125

Borehole Notes:

Borehole 10-06-10 was drilled in April 1962 to a depth of 75 ft with 6-in. casing. Data from the drilling log and Chamness and Merz (1993) were used to provide borehole construction information. In July 1978, this borehole was deepened to 130 ft and the 6-in. casing was extended to a depth of 125 ft. A 16-ft length of temporary 8-in. surface casing was installed to facilitate the deepening of the borehole. The annulus between the 6-in. borehole casing and the 8-in. surface casing was stemmed with grout from 16 ft to the ground surface as the surface casing was removed. The bottom of the borehole was backfilled with grout from 130 to 125 ft. There is no mention that the 6-in. casing was perforated.

"As-built" drawings for the A Tank Farm indicate the original borehole was constructed with 6-in., schedule-30 pipe; however, this type of pipe was not identified in applicable engineering references. The thickness of the borehole casing is assumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. casing.

The top of the borehole casing, which is the zero reference for the SGLS, is approximately flush with the ground surface.

Equipment Information

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1996</u>	Calibration Reference : <u>GJO-HAN-13</u>	Logging Procedure : <u>P-GJPO-1783</u>

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>10/28/1996</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>8.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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10-06-10**Log Event A**

Log Run Number :	<u>2</u>	Log Run Date :	<u>10/29/1996</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>124.5</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>85.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>3</u>	Log Run Date :	<u>10/30/1996</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>86.0</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>75.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>4</u>	Log Run Date :	<u>10/31/1996</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>76.0</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>39.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>5</u>	Log Run Date :	<u>11/01/1996</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>40.0</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>7.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Logging Operation Notes:

This borehole was logged by the SGLS in five log runs. The total logging depth achieved was 124.5 ft.

Analysis Information

Analyst : E. LarsenData Processing Reference : MAC-VZCP 1.7.9Analysis Date : 03/18/1998**Analysis Notes :**

The pre-survey and post-survey field verification for each logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the accepted calibration spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

A casing correction factor for a 0.280-in.-thick steel casing was applied to the concentration data during the analysis process.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.



Spectral Gamma-Ray Borehole Log Data Report

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A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Results/Interpretations:

The man-made radionuclide Cs-137 was detected in this borehole. The Cs-137 contamination was measured continuously from the ground surface to a depth of 12.5 ft. Several isolated occurrences of Cs-137 were detected between 38.5 and 93 ft. Intermittent zones of isolated and continuous Cs-137 contamination were detected between 106 ft and the bottom of the logged interval (124.5 ft).

A zone of decreased K-40 concentration values occurs between 2.5 and 12 ft. Increased Th-232 values occur from 12 to 22 ft. A peak in the U-238 concentration values occurs at 55 ft. The KUT concentration values increase at about 106 ft and generally remain elevated to the bottom of the logged interval.

Shape factor analysis was not used to determine the distribution of contaminants around this borehole because of the presence of grout around the upper portion of the borehole and because the Cs-137 count rates detected below the grouted interval were below the minimum limits required to produce CsSF1 results.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank A-106.